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FIELD-NOTES OF WESTERN BOTANY.—I.

By EDWARD L. GREENE.

During my now almost twenty years of residence eastward, in the valley of the Potomac River, very often, in the course of the spring season, I have taken respite from arduous work in library, herbarium, and at the writing table, for a few weeks, and delighted and refreshed myself by rambles in several parts of the Middle West, and sometimes on ground where more than fifty years since the keen pleasure of arduous and careful botanizing began to be enjoyed.

The field itself, some few small parts of which have furnished the substance of these Notes, is of very great extent, surpassing the combined area of the Eastern and Middle States, several times told; and no skilled botanist could spend three days of field work in any small section of it without noting interesting facts in plenty which are told in none of those manuals, each of which idly, and even audaciously, pretends to contain all that is worth knowing about the botany of that vast stretch of territory, the Prairie States.

Myosurus minimus, Linn.

This plant, though written of in the books as if occurring almost anywhere between Ontario, Florida, and from Virginia westward to the Mississippi and even far beyond it, is in reality very seldom met with anywhere; so seldom that I dare venture the guess that more than one in ten of the botanists of our land has ever seen it alive. I know no record of its having been met with in all New England, New York, New Jersey, and Pennsylvania, and the single station for it in Ontario seems very isolated. During some forty seasons of much botanizing in regions lying

eastward of the Mississippi, I have met with the plant but twice; first near Nashville, Tennessee, in 1863, last in the prairie region of south-central Illinois, in 1908. In this last instance I was impressed by the copious abundance of the plant and the fact of its occurrence there only as a weed in land long under cultivation. The individuals could have numbered hundreds of thousands, and they were growing amid more scattering and rather small plants of shepherd's purse, more or less chickweed, this dwarfed as it usually is when exposed in the open field to the full glare of sunlight all day, and there were masses here and there of *Poa Chapmaniana*, also almost everywhere a small annual or biennial *Ranunculus* of the alliance of *R. abortivus*, yet very distinct from that and even from the western *R. micranthus*, but for which I have not yet invented a name or written a diagnosis.

The tract of land where myosurus and all these its associates grew so thriftily was a fallow field. Indian corn had been grown there the second season before, then it had lain fallow for a year; and the date of my study there was in the very early part of the month of May; so that this crop of weeds, botanically so very interesting, had held possession of that field, remaining undisturbed there, all through the late summer and the autumn of the year 1907, the whole of 1908, and through almost the whole spring season of 1909.

I have long entertained a suspicion that this *Myosurus minimus* of the United States is not native here, and have been ready to believe that it came into our flora in the first place as a chance introduction from Europe.

American botanists of the seventeenth and eighteenth centuries—and they were a numerous as well as a goodly company—knew nothing of any myosurus as occurring here. None of the Bartrams, Marshalls, Collinses, well travelled as most them were, especially southward where it was destined first to be met with, ever came upon it. Other men, and later, like Michaux, Pursh, and Nuttall, who travelled still more widely, and further southward and southwestward, and each with keener eyes, as having every one, in his own mind, the purpose of writing a general Flora of the country, knew nothing of the existence of the genus in America. This was the status of the case as late as the year 1818, or near the end of the second decade of the nineteenth century. At about this time Dr. Short, of Hopkinsville, Kentucky, sent to

Rafinesque some specimens of *Myosurus* gathered by himself at the place named. An account of the plant, as presumably indigenous to Kentucky, was published by Rafinesque in 1819 (Sillim. Am. Journ. i. 379). Several years afterwards, Dr. Leavenworth found the plant near Augusta, Georgia, so that Elliott was enabled to admit it to his Flora—now long since become the great classic of southern botany—as an American plant (Ell. Sk. i. 582). I think its second appearance by name and description in one of our Floras was with Eaton & Wright, who reports it as exclusively Southern. This was in 1840, yet so rare was the plant even at the South, that Chapman in the last issue of his Flora, which was in 1897, mentions the two localities for it as Augusta Georgia, and Nashville, Tennessee; and Dr. Small, in even the latest issue of his Flora, adds nothing definite about its distribution there.

It is not needful to trace here step by step the history of its appearing as an element in the floras of somewhat more northerly sections of the country; but there are two interesting facts to be taken note of respecting its distribution in this country which should be considered. One of them is this, that *Myosurus minimus* as from Georgia, Tennessee, and Kentucky, does not spread northward at all, except for a little distance, and its advance this way is very slow. I think it was not heard of as being within the borders of so southerly a State as Virginia until the year 1893, when Mr. Coville collected small specimens of the species at Norfolk, on the first of April. On this it is remarked in Britton and Brown that it seems there like an introduced plant; and such beyond doubt it is; for if it had been native in any of that part of Virginia, some one or more of the ardent explorers of Virginian botany of one hundred and even two hundred years ago most probably would have found and recorded it. Its introduction at Norfolk, then, may be believed to have taken place quite recently.

Again, quite well southward, even not so far from where Dr. Short almost a hundred years since gathered it in Kentucky, is my Illinois station for the plant, where also it grows only on cultivated ground. The locality is in Marion County, a mile or more from the town of Odin, going westward along the railway, and where having observed it in so surprising an abundance, yet in a

fallow and weedy field, I at once began searching for it in all manner of wild lands, but with no success.

Circumstances like these seem to indicate that *Myosurus minimus* is in America as adventive, and even here and there naturalized, from Europe. But there are other facts relating to its distribution here that may not seem so easily reconcilable to that view. One such fact is that of its much more frequent occurrence and apparently up and down the whole length of the country in the States that lies on the western banks of the Mississippi River. It is credited to the Dakotas, Nebraska, and Kansas, and in western Missouri Mr. B. F. Bush has found it in many places. It is mentioned as being "locally common" there. The expression is that of Mackenzie and Bush, in the Flora of Jackson County, and will be understood as saying that in each of its scattered localities there is plenty of it. But Mr. Bush also obtains it, or what he calls by that name, in Arkansas, Oklahoma, and even Texas. It has also been obtained, but very scantily, on the Rocky Mountain plains, in Colorado, and in Wyoming. As regards Colorado, however, we are to-day wholly without evidence that the species ever was naturally other than foreign to that flora. According to Mr. Rydberg it was never found there but once, and that long ago, at Denver, by Miss Eastwood. There might have been another citation of it for that same locality if the author of the Colorado Flora had consulted my own rich herbarium of Colorado plants; for I now find therein a good specimen of *Myosurus minimus* collected by myself at Denver in 1870. Even the label was written by me forty years since, and it reads Denver, whereby I am assured that I must have found the plant within the limits of the straggling town of perhaps 7000 people, which was all there was of it at that date, and before the advent of the first railway, and while there was yet no State of Colorado, but only the Territory of that name. Miss Eastwood's sojourn in Denver must have been some ten years or more subsequent to mine, and we have proof of the plants' survival there in her day, but since then no more seems to have been heard of it as in Colorado at all; and what in 1870, and even in 1880, were the wild untilled plains and sand hills where wild plants grew, and where *myosurus* chanced to be, is now a part of the very heart of the great city, and the little adventive may have become extinct.

I reasonably account for its early occurrence, and at that

sole point within Colorado, by a retrospect of Denver's early history. In the course of much immigration by wagon train across the plains to the Colorado mining districts, at the crossing of the Platte, only a two-days journey from the mines, all immigration came to a halt; and man and beast rested there for some days, and were refreshed before proceeding. In the midst of this riverside resting place enterprising tradesmen spread their tents or built their sheds or shops of merchandise; and these were the beginnings of Denver. Many a weed and small herb from the East and the South must have reached its introduction into Colorado by that tide of immigration; some of them probably unable to maintain other than a transient foothold, and apparently *myosurus* was among these.

Whether or not this conjecture about the transiency of *myosurus* at Denver shall prove to be the truth, certain it seems that the plant has gained its best development, as well as its strongest foothold in America in the northern parts of Missouri, and in south-central Illinois, tracts of great extent, and in nearly the same latitude. The most perfect-specimens of the species which exist in the U. S. Herbarium or in my own were distributed from near Allenton, Missouri, by Mr. Letterman. None from Europe equal them in the size and fertility of the individual plant; but when we come to speak of the material brought from far away Texas, we object that the largest and best specimens distributed by the zealous and efficient Mr. Bush of Missouri, are not *M. minimus* at all, but represent a species indigenous there, and which seems to be awaiting a name and an indication of its very good characters.

To those who have any fair knowledge of North American botany as a whole, it is well known that on both sides of the Mexican boundary beyond Texas, and also up the coast through California, and even to British Columbia, there exist not a few native species of this genus whose validity no one doubts or can doubt who has seen them; but also *M. minimus* itself is found here and there on that side of the continent, and without doubt introduced; it is therefore to be apprehended that *mysurus*, both in the original European type, and in the form of one or more of western indigenous species, may make its way into our regions eastward, from the Pacific slope, if indeed it may not have done so already.

By way of incentive to future observation on this genus as in the United States eastward let us here take note of two important matters, and first, that of the great scarcity of it to the eastward of the Mississippi River. We have already seen that it has long been known to occur here and there in the South, and to the northward of the Ohio River only in southern Illinois. All the rest of Illinois, the whole of Indiana, Ohio, Michigan, Wisconsin, Minnesota, and Iowa, show no record of *myosurus*. Then continuing eastward, Pennsylvania, New York, the whole of New England, and even down to New Jersey, Delaware, Maryland and West Virginia form an empire of territory destitute of *Myosurus*, as far as knowledge goes. Nor has it been found in either of the Carolinas. Its advent into any one of those states, aggregating as they do far the greater part of the Atlantic slope within the U. S. is to be watched for in the future. The second matter to be taken under careful observation is whether, in a given locality, the plant may the more probably have come in from the West or from the South.

The most isolated of known American stations for *Myosurus minimus* is that at Belleville, near the northwestern shore of Lake Ontario in eastern Canada, where it was discovered and collected as long ago as 1878, by Mr. John Macoun. It is at a much greater distance from the familiar Southern Midland *myosurus* territory than Denver is, and is in nothing like direct communication with any part of the United States where the species, or the genus is known. It is beyond all doubt in my mind that this East Canadian plant is an importation from some part of British Columbia or Alberta, where the species is known to occur. This interesting station, however, about which I think nothing more has been heard these last thirty-five or forty years, deserves to be revisited and the plants investigated in the light of what has been herein suggested.

Hepatica acutiloba, DC.

On a considerable number of fresh plants of this, which some years since Mr. William R. Maxon kindly procured for me from northern New York, and which were coming into flower when they reached me at Washintgon, I observed that nearly all the plants showed almost completely unisexual flowers; some exhibiting many stamens but with barely two or three pistils,

others the fullest complement of pistils but only a stamen or two, or in some I think not one. I must here state, in passing, that having a desire to study these New York plants another season, I went out to Rock Creek Park, sought there in the deep woods, a cool moist northward slope, such as this species likes, and planted them with all care, and at a place to which I believed I should easily find my way at any time; but I have sought it since in vain. The species is entirely foreign to the flora of this region. Supposing that colony which I planted, the locality of which I seem to have lost, survives, the possible future discoverer of it will stand admonished not to take the species to be indigenous there.

In the middle of May of this year 1914, in western Wisconsin, I had an opportunity of seeing and collecting this species in fruit. The achenes had reached their full size and were very nearly mature; and now I noticed, while selecting good fruiting specimens, that such as had no fruit bore among their leaves a full complement of mere naked peduncles, which, however, had in no degree withered, but were still alive and fresh despite their infertility and their nudity, by which latter term I mean that not only what we have been taught to call the flower had fallen, but even also the so-called involucreal leaves. I seemed to have before me evidence not only perfect dioecism in this hepatica, but also that what we have been taught to regard as the involucre in these plants, is really a calyx, and that the supposed sepals are a corolla. The consideration of such a fact as this, and one so strongly suggestive of a possible revolution in our philosophy of the hepatica flower, must lead to its further observation. The living but sterile peduncles seemed to end as abruptly as if there had been a joint where the "involucre" had broken away. The precise locality at which these observations were made is on a steep rocky but densely wooded slope above the Wisconsin River, at Woodman, Wisconsin.